

# Universal Quantization for Separate Encodings and Joint Decoding of Correlated Sources \*

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## Abstract

We consider the multi-user lossy source-coding problem for continuous alphabet sources. In a previous work, Ziv proposed a single-user universal coding scheme which uses uniform quantization with dither, followed by a lossless source encoder (entropy coder). In this paper, we generalize Ziv's scheme to the multi-user setting. For this generalized universal scheme, upper bounds are derived on the redundancies, defined as the differences between the actual rates and the closest corresponding rates on the boundary of the rate region. It is shown that this scheme can achieve redundancies of no more than 0.754 bits per sample for each user. These bounds are obtained without knowledge of the multi-user rate region, which is an open problem in general. As a direct consequence of these results, inner and outer bounds on the rate-distortion achievable region are obtained.

**Index Terms:** Multi-terminal source coding, Dithered quantization, Universal source coding, scalar quantization, Slepian-Wolf coding.

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